Outcome 1 – Centre (a, b) radius r

Bronze examples

Examples... The equation of a circle centre (a,b) with radius r is

Given on the formula sheet!

$$(x-a)^2+(y-b)^2=r^2$$

Find the centre and radius of a circle with equation $(x-5)^2+(y+3)^2=16$

$(5,-3)$ $r=4$

Write the equation of a circle with centre (-2, 9) and radius 6.

$$(x+2)^2+(y-9)^2=36$$

Bronze questions

Find the centre and radius for the following circles...

1. $(x-9)^2+(y-5)^2=100$
2. $(x-3)^2+(y+7)^2=64$
3. $(x+6)^2+(y+9)^2=8$
4. $x^2+y^2=169$

Write the equation of for the circles with these centres and radii...

5. $(8,-6)$ $r=7$
6. $(-1,10)$ $r=3$
7. $(5,1)$ $r=8$
8. $(0,-3)$ $r=15$

Outcome 2 – The General Equation

Silver example

Examples... **Given on the formula sheet!**

The general equation of any circle is...

$$x^2+y^2+2gx+2fy+c=0$$

with centre $(-g,-f)$

and radius $\sqrt{g^2+f^2-c}$

Half them and change the sign

Find the centre and radius of a circle with equation $x^2+y^2+2x-14y-4=0$

$(-1, 7)$ $r=\sqrt{1+49+4}=\sqrt{54}=3\sqrt{6}$

Silver questions

1. $x^2+y^2+2x+8y+8=0$
2. $x^2+y^2-8x+10y+5=0$
3. $x^2+y^2+16x-4y-13$
4. $x^2+y^2-12x-6y-4=0$
5. $x^2+y^2-20y+36=0$
6. $2x^2+2y^2-16x-20y+18=0$

Outcome 3 – When given 2 end points

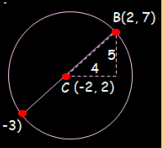
Gold example

Examples... 1. Draw a sketch

Find the equation of the circle which has A(-6, -3) and B(2, 7) as the end points of a diameter.

2. Get centre (the midpoint!)

C(-2, 2)



3. Get radius

(draw a triangle and use Pythag!)

$r=\sqrt{41}$ $4^2+5^2=41$

4. Write equation

Use $(x-a)^2+(y-b)^2=r^2$

$$(x+2)^2+(y-2)^2=41$$

Gold questions

Find the equation of the circles with the following coordinates as the end points of a diameter...

1. A(1, 8) and B(5, 10)
2. P(2, 3) and Q(8, 7)
3. M(-6, 1) and N(6, -1)
4. E(-10, -2) and F(4, 2)
5. C(-7, -8) and D(-1, 4)
6. R(-2, -8) and S(3, 7)

Bronze Answers

1. $C(9, 5)$ $r = 100$
2. $C(3, 7)$ $r = 8$
3. $C(-6, -9)$ $r = 2\sqrt{2}$
4. $C(0, 0)$ $r = 13$
5. $(x - 8)^2 + (y + 6)^2 = 49$
6. $(x + 1)^2 + (y - 10)^2 = 9$
7. $(x - 5)^2 + (y - 1)^2 = 64$
8. $x^2 + (y + 3)^2 = 225$

Silver Answers

1. $C(-1, -4)$ $r = 3$
2. $C(4, -5)$ $r = 6$
3. $C(-8, 2)$ $r = 9$
4. $C(6, 3)$ $r = 7$
5. $C(0, 10)$ $r = 8$
6. $C(4, 5)$ $r = 4\sqrt{2}$

Gold Answers

1. $(x - 3)^2 + (y - 9)^2 = 5$
2. $(x - 5)^2 + (y - 5)^2 = 13$
3. $x^2 + y^2 = 37$
4. $(x + 3)^2 + y^2 = 53$
5. $(x + 4)^2 + (y + 2)^2 = 45$
6. $(x - \frac{1}{2})^2 + (y + \frac{1}{2})^2 = 62{\cdot}5$